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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,332	07/27/2001	Jerome Duplaix	86177-11	7089

7590 12/13/2005

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EXAMINER	
MERED, HABTE	
ART UNIT	**PAPER NUMBER**
2662	

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/915,332	DUPLAIX ET AL.	
	Examiner	Art Unit	
	Habte Mered	2662	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30,35 and 38-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1--30,35 and 38-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

A. The amendment filed on 23 September 2005 has been entered and fully considered.

B. Claims 31-34 and 36-37 are cancelled by the amendment filed on 23 September 2005.

C. Claims 1-30, 35, and 38-51 are pending.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1-21, 23-25, 30, 42-47** and **50-51** are rejected under 35 U.S.C. 102(e) as being anticipated by Tsukakoshi et al (US 6, 577, 634), hereinafter referred to as Tsukakoshi.

3. Regarding **claim 1**, *Tsukakoshi discloses a router device with route calculation units and forwarding units. The route calculation unit has a CPU and memory and has two or more routing protocol means to handle different types of protocols. Similarly the forwarding unit has a CPU as a forwarding processor and a memory unit. The router device's forwarding unit serves as the I/O unit and interfaces with external devices. The*

routing calculation unit constitutes the routing layer while the forwarding unit defines the I/O layer. The router device disclosed by Tsukakoshi is in effect a clustered router and appears to other external routers and communication terminals as a single network forwarding apparatus. **(See Column 3, Lines 62-67)**

Tsukakoshi discloses a router supporting multiple routing protocols **(See Column 3, Lines 18-20; Figure 1 element 15; Each routing calculation unit can handle two different routing protocols)** comprising:

a. an interface layer including a plurality of I/O controllers, each I/O controller implementing an I/O port; **(See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

b. a switching layer in communication with the interface layer for selectively establishing signal pathways between I/O ports; **(See Figure 4, element 46; Column 4, Line 40)**

c. a routing layer in communication with the interface layer, and the routing layer having at least first and second routing protocol computing entities, each routing protocol computing entity <u>being associated with a distinct subset of at least one routing protocol from a common set of routing protocols</u> including: **(Tsukakoshi discloses each router entity 12 in Figure 1 contains two or more routing protocol means 15 as shown in Figure 1. See Column 3, Line 19. Further, Tsukakoshi shows that each router entity 12 in Figure 1 can contain more than two routing protocol means 15 which**

can easily be verified in Figure 3 that there are three running different protocols – protocol A, B, and C. See Column 2, Lines 37-38 and Column 14, Lines 13-20. Further Tsukakoshi shows how routing protocol A is being used in a peer to peer session between router 1 and router 2 of the clustered router device in Figures 10 and 11 and Column 6, Line 12. Obviously this is clear to one skilled in the art that Protocols A, B, C are just meant to indicate that any distinct subset of protocols from a common set of routing protocols known in the art of network engineering can be used. Further in Column 8, Lines 25-28 and 42-47 it is clearly shown in router entity 12 more than one protocol is running because the NISP has to select the routing protocol means 15 that only runs the RIP protocol and not other routing protocol means that are running different protocols as the router has at least two or more routing protocol means. The NISP uses protocol field in the packet received to determine what protocol is running as shown in Figures 5-9 and further in Column 6, Lines 4-5 it is shown that there is no restriction on the type of protocol that can run on router entity 12. See also Column 6, Lines 57-59.)

i. a CPU **(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU **(See element 42, Figure 4)**;

iii. program data stored in the data storage medium for execution by the CPU **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the**

program data has to be stored in the storage medium shown in Figure 4 as element 42);

d. the program data in the data storage medium of each routing protocol computing entity effecting management of one or more peering sessions with remote routing devices according to only the at least one routing protocol in the associated subset, when executed by the CPU of the respective routing protocol computing entity. **(Applicant on page 7, Line 6 of the specification defines peering session to be a communication session between two different routers. Tsukakoshi discloses the clustered router is seen as a single entity by external devices like router 25 in Figure 1. Tsukakoshi further discloses that a communication or peering session can be established between the clustered router and any device like router 25 to continuously exchange packets. Each router unit in the clustered router can have a peering session with remote devices using the first and/or second protocol means. See also Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5. It has already been established that Tsukakoshi's clustered router device can run any subset of routing protocols from a common set of routing protocols used in the art of networking.)**

4. Regarding **claim 2**, Tsukakoshi discloses a router wherein each routing protocol computing

entity is operative to maintain simultaneously a plurality of peering sessions with remote routing devices. **(Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**

5. Regarding **claim 3**, Tsukakoshi discloses a router wherein each routing protocol computing entity exchanges data with a remote routing device through the I/O interface layer during a peering session. **(Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**

6. Regarding **claim 4**, Tsukakoshi discloses a router, wherein the peering session includes a transfer of route information data from the router to a remote routing device. **(Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**

7. Regarding **claim 5**, Tsukakoshi discloses a router, wherein the peering session includes a transfer of route information data from a remote routing device to the router. **(Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**

8. Regarding **claim 6**, Tsukakoshi disclose a router, wherein the data storage medium **(element 42 in Figure 4)** of the first routing protocol computing entity, stores a local routing table **(element 17, in Figure 1)** holding at least one inbound route database derived at least in part from route information data transferred from a remote routing device **(element 25 in Figure 1)** to the router. **(Column 3, Lines 23-27;Column 4, Lines 44-52)**

9. Regarding **claim 7**, Tsukakoshi discloses a router wherein the first routing protocol computing entity applies an inbound policy processing on the route information data transferred from a remote routing device during generation of the inbound route database. **(Column 3, Lines 23-27;Column 4, Lines 44-52;This is strictly a function of the routing protocol. This is implemented with a policy based routing protocol**

like BGP. Tsukakoshi's device can work with any routing protocol including BGP.)

10. Regarding **claim 8**, Tsukakoshi discloses a router wherein the local routing table holds a best route database, the fast routing protocol computing entity applies an outbound policy processing on the best route database to generate at least one outbound route database, the first routing protocol computing entity being operative to transfer route information data from the outbound route database to a remote routing device. **(Column 3, Lines 23-27;Column 4, Lines 44-52;This is strictly a function of the routing protocol. This is best implemented with a policy based routing protocol like BGP. Tsukakoshi's device can work with any routing protocol including BGP.)**

11. Regarding **claim 9**, Tsukakoshi discloses, wherein the data storage medium **(element 42, Figure 4)** of each routing protocol computing entity stores a local routing table **(element 17, Figure 1)** holding at least one inbound route database derived from route information data transferred from a remote routing device **(element 25, Figure 1)** to the router. **(Column 3, Lines 23-27, Column 4, Lines 44-52)**

12. Regarding **claim 10**, Tsukakoshi discloses a router, wherein each routing protocol computing entity applies an inbound policy processing on the route information data transferred from a remote routing device during generation of the inbound route database. **(Column 3, Lines 23-27;Column 4, Lines 44-52;This is strictly a function of the routing protocol. This is implemented with a policy based routing protocol**

like BGP. Tsukakoshi's device can work with any routing protocol including BGP.)

13. Regarding **claim 11**, Tsukakoshi discloses a router, wherein the local routing table of each routing protocol computing entity holds a best route database, <u>the at least one</u> routing protocol <u>in each subset</u> applies an outbound policy processing on the best route database to generate at least one outbound route database, each routing protocol computing entity being operative to transfer route information data from the outbound route database to a remote routing device. **(Column 3, Lines 23-27;Column 4, Lines 44-52; This is strictly a function of the routing protocol. This is best implemented with a policy based routing protocol like BGP. Tsukakoshi's device can work with any routing protocol including BGP.)**

14. Regarding **claim 12**, Tsukakoshi discloses, wherein the routing layer includes a control computing entity in data communicative relationship with each routing protocol computing entity (**See Column 4, Lines 39-52**), and the control computing entity includes:

a. a CPU **(See element 41 in Figure 4)**;

b. a data storage medium in communication with the CPU **(See element 42 in Figure 4)**;

C. a program data stored in the data storage medium for execution by the CPU**(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the**

program data has to be stored in the storage medium shown in Figure 4 as element 42);

d. a master routing table stored in the data storage medium **(See element 17 in Figure 1; Column 4, Lines 50-52).**

15. Regarding **claim 13**, Tsukakoshi discloses a router, wherein the program data stored in the data storage medium of the control computing entity implements a routing table manager for managing the master routing table. **(It is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42. The routing table has to be managed by the program data to determine when to read from and write to the table)**

16. Regarding **claim 14**, Tsukakoshi discloses a router, wherein each routing protocol computing entity is in communication with the control computing entity to transfer to the data storage medium of the control computing entity data from the inbound route database. **(Column 3, Lines 18-27)**

17. Regarding **claim 15**, Tsukakoshi discloses a router, wherein the routing table manager is operative to apply a master policy processing on data received from the inbound routing database in each routing protocol computing entity to generate the master routing table. **(Column 3, Lines 31-57; In Tsukakoshi's clustered router each routing table is a master routing table as each table gets updated with new route**

info using the NISP protocol. In case of failure the routing table located in the backup unit will be up to date when the unit is activated)

18. Regarding **claim 16**, Tsukakoshi discloses a router, wherein the master policy processing includes merging the data in the inbound routing databases from the first and the second routing protocol computing entities to produce merged inbound routing data. **(If the routing protocol is the same for the two entities then the data has to be merged and if the protocols are different the occurrence of a uniform merging is not necessarily true. This is also a function of policy based routing protocols like the BGP.)**

19. Regarding **claim 17**, Tsukakoshi discloses a router, wherein the merged inbound routing data includes information mapping destinations and routes to the destinations. **(Column 3, Lines 23-27; This is standard information contained in most routing data.)**

20. Regarding **claim 18**, Tsukakoshi discloses a router, wherein the merged inbound routing data includes a plurality of destinations and a set of routes associated with each destination of the plurality of destinations, the master policy processing includes discarding from each set of routes a plurality of routes and retaining only a subset of the set of routes. **(This is strictly a function of the routing protocol chosen. Tsukakoshi's clustered can accommodate any routing protocol. For instance BGP is a policy based routing protocol that selects best routes on the values of the BGP attributes)**

21. Regarding **claim 19,** Tsukakoshi discloses a router, wherein the control computing entity is operative to transfer to the data storage medium of the first routing protocol computing entity at least a portion of the master routing data to form the best route database in the data storage medium of the first routing protocol computing entity. **(See Column 3, Lines 18-20; Note that determining the best route is a function of the routing protocol like BGP and not the actual router)**

22. Regarding **claim 20**, Tsukakoshi discloses a router, wherein the control computing entity is operative to transfer to the data storage medium of the second routing protocol computing entity at least a portion of the master routing data to form the best route database in the data storage medium of the second routing protocol computing entity. **(See Column 3, Lines 18-20; Note that determining the best route is a function of the routing protocol like BGP and not the actual router)**

23. Regarding **claim 21**, Tsukakoshi discloses a router, wherein each I/O controller includes a forwarding processor, when a data packet is received at the I/O controller, the forwarding processor determines an I/0 port of the interface layer through which the data packet is to be released, where the forwarding processor including a data storage medium holding a forwarding table, and the forwarding table includes data derived from the master routing table. **(Column 4, Lines 53-64)**

24. Regarding **claim 23**, Tsukakoshi discloses a router, comprising:

a. an interface layer including a plurality of I/0 controllers, each I/O controller implementing an I/O port (**See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to**

transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1);

b. a switching layer in communication with the interface layer for selectively establishing signal pathways between the I/O ports **(See Figure 4, element 46; Column 4, Line 40);**

C. a routing layer in communication with the interface layer, the routing layer having at least first and second routing protocol computing entities, each routing protocol computing entity **(See Column 4, Lines 39-52)** including:

i. a CPU **(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU **(See element 42, Figure 4)**;

iii. a program data stored in the data storage medium for execution by the CPU **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42)**;

d. the program data in the storage medium of the first routing protocol computing entity effecting management of one or more peering sessions with remote routing devices according to a first routing protocol, when executed by the CPU of the first routing protocol computing entity **(Applicant on page 7, Line 6 of the specification defines peering session to be a communication session between two different routers.**

Tsukakoshi discloses the clustered router is seen as a single entity by external devices like router 25 in Figure 1. Tsukakoshi further discloses that a communication or peering session can be established between the clustered router and any device like router 25 to continuously exchange packets. Each router unit in the clustered router can have a peering session with remote devices using the first and/or second protocol means. See also Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5);

e. the program data in the storage medium of the second routing protocol computing entity effecting management of one or more peering sessions with remote routing devices according to a second routing protocol when executed by the CPU of the second routing protocol computing entity **(Applicant on page 7, Line 6 of the specification defines peering session to be a communication session between two different routers. Tsukakoshi discloses the clustered router is seen as a single entity by external devices like router 25 in Figure 1. Tsukakoshi further discloses that a communication or peering session can be established between the clustered router and any device like router 25 to continuously exchange packets. Each router unit in the clustered router can have a peering session with remote devices using the first and/or second protocol means. See also Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**;

and

f. the first routing protocol being the same as the second routing protocol **(See Column 6, Lines 11-15; Tsukakoshi discloses RIP as one of the many different routing**

protocols handled by the system and each routing protocol means entity can run different routing protocols.).

g. the management of one or more peering sessions effected by the program data in the data storage medium of the first routing protocol computing entity comprising maintaining in the data storage medium **(Figure 4, element 42)** of the first routing protocol computing entity **(Figure 1, element 15)** one or more inbound route databases **(Figure 1, element 17)** containing route information derived from information received during one or more peering sessions managed by the first routing protocol computing entity; **(See Column 8, Lines 48-50 and Column 3, Lines 20-26; Tsukakoshi shows that each protocol means that runs a specific routing protocol during a peering session extracts specific network routing information and puts it in element 16 of Figure 1 and then creates a routing table.)**

h. the management of one or more peering sessions effected by the program data in the data storage medium of the second routing protocol computing entity comprising maintaining in the data storage medium of the second routing protocol computing entity one or more inbound route databases containing route information derived from information received during one or more peering sessions managed by the second routing protocol computing entity; **(See Column 8, Lines 48-50 and Column 3, Lines 20-26; Tsukakoshi shows that each protocol means that runs a specific routing protocol during a peering session extracts specific network routing information and puts it in element 16 of Figure 1 and then creates a routing table.)**

i. <u>the one or more inbound route databases of the first routing protocol computing entity not containing at least some of the route information contained in the one or more inbound route databases of the second routing protocol computing entity</u>. **(Clearly Tsukakoshi shows during a peering session routing information specific to the protocol running on the routing protocol means is kept separately as network information in element 16 of Figure 1. This is further confirmed in the discussion in Column 8, Lines 48-50. The network information is the basis for deriving the final non-protocol specific information and is used strictly for routing calculation as indicated in Column 3, Lines 24-26. The Routing Table 17 in Figure 1 is similar to the master routing table 60 mentioned in the specification on page 13, Lines 14-15. The network information 16 of Figure 1 encompasses all of the inbound and outbound policies derived from the peering session mentioned in the specification on pages 9 and 10 and is inherent to the construction any routing table.)**

25. Regarding **claim 24**, Tsukakoshi discloses a router, wherein the first routing protocol and the

second routing protocol are distance vector protocols. **(Column 3, Lines 18-23; Column 6, Lines 1-10; Tsukakoshi's router is not limited by the type of the routing protocol chosen.)**

26. Regarding **claim 25**, Tsukakoshi discloses a router, wherein the first routing protocol and the second routing protocol are link state protocols. **(Column 3, Lines 18-**

23; Column 6, Lines 1-10; Tsukakoshi's router is not limited by the type of the routing protocol chosen.)

27. Regarding **claim 30**, Tsukakoshi discloses a router, wherein the first routing protocol and the second routing protocol are BGP. **(Column 3, Lines 18-23; Column 6, Lines 1-10; Tsukakoshi's router is not limited by the type of the routing protocol chosen.)**

28. Regarding **claim 42**, Tsukakoshi disclose a router, comprising:

a. an interface layer including a plurality of I/O controllers, each controller implementing at least one I/O port**(See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

b. a switching layer in communication with the interface layer for selectively establishing signal pathways between the I/O ports**(See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

c. a routing layer in communication with the interface layer, where the routing layer has at least first and second routing protocol computing entities, each routing protocol computing entity**(See Column 4, Lines 39-52)** including:

i. a CPU **(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU **(See element 42, Figure 4)**;

iii. a program data stored in the data storage medium for execution by the CPU **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42)**;

d. the program data in the storage medium of the first routing protocol computing entity effecting management of one or more peering sessions with remote routing devices according to a first routing protocol, when executed by the CPU of the first routing protocol computing entity**(Applicant on page 7, Line 6 of the specification defines peering session to be a communication session between two different routers. Tsukakoshi discloses the clustered router is seen as a single entity by external devices like router 25 in Figure 1. Tsukakoshi further discloses that a communication or peering session can be established between the clustered router and any device like router 25 to continuously exchange packets. Each router unit in the clustered router can have a peering session with remote devices**

using the first and/or second protocol means. See also Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5);

e. the program data in the storage medium of the second routing protocol computing entity effecting management of one or more peering sessions with remote routing devices according to a second routing protocol when executed by the CPU of the second routing protocol computing entity**(Applicant on page 7, Line 6 of the specification defines peering session to be a communication session between two different routers. Tsukakoshi discloses the clustered router is seen as a single entity by external devices like router 25 in Figure 1. Tsukakoshi further discloses that a communication or peering session can be established between the clustered router and any device like router 25 to continuously exchange packets. Each router unit in the clustered router can have a peering session with remote devices using the first and/or second protocol means. See also Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**;

f. the data storage medium of the routing protocol computing entity holding a local routing table storing an inbound routing database derived from route information transferred from a remote routing device during a peering session managed by the first routing protocol computing entity**(See Column 3, Lines 20-30 and Column 10, Lines 20-25)**;

g. the data storage medium of the second routing protocol computing entity holding a local routing table storing an inbound routing database derived from route information transferred from a remote routing device during a peering session managed by the

second routing protocol computing entity **(See Column 3, Lines 20-30 and Column 10, Lines 20-25)**;

h. the routing layer including a control computing entity in data communicative relationship with each routing protocol computing entity, where the control computing entity **(See Column 4, Lines 39-52)** includes:

i. a CPU**(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU of the control computing entity**(See element 42, Figure 4)**;

iii. a master routing table stored in the data storage medium of the control computing entity, where the master routing table holding a master routing database derived at least in part from the inbound routing database of the first routing protocol computing entity and from the inbound routing database of the second routing protocol computing entity**(See element 17 in Figure 1; Column 4, Lines 50-52; Column 3, Lines 20-30 and Column 10, Lines 20-25)**;

iv. program data in the data storage medium of the control computing entity for execution by the CPU of the control computing entity to implement a main routing table manager to manage the master routing table **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42. The routing table has to be managed by the program data to determine when to read from and write to the table)**;

I. a backup computing entity, in data communicative relationship with the first and second routing protocol computing entities and with the control computing entity **(See Figure 18; Column 10, Lines 6-25)**, and the backup computing entity includes:

i. a CPU**(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU of the backup computing entity**(See element 42, Figure 4)**;

iii. program data in the data storage medium of the backup computing entity for execution by the CPU of the backup computing entity to implement a main routing table manager **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42. The routing table has to be managed by the program data to determine when to read from and write to the table)**;

iv. the backup computing entity being responsive to an operational failure of the control computing entity **(See Column 10, Lines 30-60)** to:

1. download the inbound routing databases from the first and second routing protocol computing entities**(Column 10, Lines 48-53)**;

2. re-build the master routing database at least in part from the inbound routing databases downloaded from the first and second routing protocol computing entities **(See Column 10, Lines 53-57)**.

29. Regarding **claims 43, 44, 46 and 47**, Tsukakoshi discloses a router, wherein the first routing protocol and the second routing protocol can be the same or different. **(Column 3, Lines 18-23; Column 6, Lines 1-10; Tsukakoshi's router is not limited by the type of the routing protocol chosen.)**

30. Regarding **claim 45**, Tsukakoshi discloses a router, comprising:

a. an interface layer including a plurality of I/0 controllers, each I/O controller implementing an I/O port **See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

b. a switching layer in communication with the interface layer for selectively establishing signal pathways between the I/O ports (**See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

c. a routing layer in communication with the interface layer, such that the routing layer having at least first and second routing protocol computing entities, each routing protocol computing entity**(See Column 4, Lines 39-52)** includes:

. a CPU **(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU(**See element 42, Figure 4)**;

iii- a program data stored in the data storage medium for execution by the CPU(**it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42)**;

d. the program data in the storage medium of the first routing protocol computing entity effecting management of one or more peering sessions with remote routing devices according to a first routing protocol, when executed by the CPU of the first routing protocol computing entity(**Applicant on page 7, Line 6 of the specification defines peering session to be a communication session between two different routers. Tsukakoshi discloses the clustered router is seen as a single entity by external devices like router 25 in Figure 1. Tsukakoshi further discloses that a communication or peering session can be established between the clustered router and any device like router 25 to continuously exchange packets. Each router unit in the clustered router can have a peering session with remote devices using the first and/or second protocol means. See also Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**;

e. the program data in the storage medium of the second routing protocol computing entity effecting management of one or more peering sessions with remote routing devices according to a second routing protocol when executed by the CPU of the

second routing protocol computing entity **(Applicant on page 7, Line 6 of the specification defines peering session to be a communication session between two different routers. Tsukakoshi discloses the clustered router is seen as a single entity by external devices like router 25 in Figure 1. Tsukakoshi further discloses that a communication or peering session can be established between the clustered router and any device like router 25 to continuously exchange packets. Each router unit in the clustered router can have a peering session with remote devices using the first and/or second protocol means. See also Column 2, Lines 11-15; Column 3, Lines 62-67; and Column 4, Lines 1-5)**;

f. the data storage medium of the first routing protocol computing entity holding a local routing table storing an inbound routing database derived from route information transferred from a remote routing device during a peering session managed by the first routing protocol computing

entity **(See Column 3, Lines 20-30 and Column 10, Lines 20-25)**;

g. the data storage medium of the second routing protocol computing entity holding a local routing table storing an inbound routing database derived, from route information transferred from a remote routing device during a peering session, managed by the second routing protocol computing entity **(See Column 3, Lines 20-30 and Column 10, Lines 20-25)**;

h. the routing layer including a control computing entity in data communicative relationship with each routing protocol computing entity, where the control computing entity **(See Column 4, Lines 39-52)** includes:

i. a CPU**(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU of the control computing entity**(See element 42, Figure 4)**;

iii. a master routing table stored in the data storage medium of the control computing entity, where the master routing table holding a master routing database derived at least in part from the inbound routing database of the first routing protocol computing entity and from the inbound routing database of the second routing protocol computing entity**(See element 17 in Figure 1; Column 4, Lines 50-52; Column 3, Lines 20-30 and Column 10, Lines 20-25)**;

iv. a program data in the data storage medium of the control computing entity for execution by the CPU of the control computing entity to implement a main routing table manager to manage the master routing table **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42. The routing table has to be managed by the program data to determine when to read from and write to the table)**;

l. a backup computing entity, in data communicative relationship with the first and second routing protocol computing entities and with the control computing entity **(See Figure 18; Column 10, Lines 6-25),** and the backup computing entity includes:

i. a CPU**(See element 41, Figure 4)**;

ii. a data storage medium in communication with the CPU of the backup computing entity**(See element 42, Figure 4)**;

iii. a program data in the data storage medium of the backup computing entity for execution by the CPU of the backup computing entity to implement a main routing table manager **(it is inherent for any processor designed to execute a series of procedures to store the instructions for the program executions in memory and in this case the program data has to be stored in the storage medium shown in Figure 4 as element 42. The routing table has to be managed by the program data to determine when to read from and write to the table)**;

iii. the program data in the storage medium of the backup computing entity for execution by the CPU of the backup computing for effecting management of one or more peering sessions with remote routing devices according to a first routing protocol **(It has already been established by Tsukakoshi that the clustered router can have a peering session with remote devices using the first and/or second protocol means. The backup computing entity will not establish any peering session when it is on stand by mode. However, once the backup unit becomes an active computing entity it can readily establish a peering session with external devices using steps taught by Tsukakoshi. See also Column 2, Lines 11-15; Column 3, Lines 62-67; Column 4, Lines 1-5; Column 10, Lines 6-25)**;

iv. the backup computing entity being responsive to an operational failure of the control computing entity **(See Column 10, Lines 30-60)** to:

1. transfer information from the master routing table to the data storage medium of the backup computing entity to re-build at least partially the local routing table of the first routing protocol computing entity**(See Column 10, Lines 33-36; Tsukakoshi discloses that the active-state route calculation unit sends update information to the backup-state route calculation unit. When the backup-state becomes active it is able to re-build the routing table as it has all the necessary updates till the last moment before the active unit failed. Also worth noting that in Tsukakoshi's system the active unit routing table and the backup unit routing table are always synchronized and up to date and can all be considered as the universal master routing tables.)**

2. enable the program data in the data storage medium of the backup computing entity to effect management of one or more peering sessions with remote routing devices according to a first routing protocol. **(It has already been established by Tsukakoshi that the clustered router can have a peering session with remote devices using the first and/or second protocol means. The backup computing entity will not establish any peering session when it is on stand by mode as it is a spare entity. However, once the backup unit becomes an active computing entity it can readily establish a peering session with**

external devices using steps taught by Tsukakoshi. See also Column 2, Lines 11-15; Column 3, Lines 62-67; Column 4, Lines 1-5; Column 10, Lines 6-25);

31. Regarding **claim 50**, Tsukakoshi discloses a router, wherein the subset of at least one protocol associated with the first routing protocol computing entity contains exactly one routing protocol and the subset of at least one routing protocol associated with the second routing protocol computing entity contains exactly one routing protocol. **(In Tsukakoshi's cluster router device each component router's routing protocol means runs exactly one protocol at the time it is configured – See Figures 1 and 3)**

32. Regarding **claim 51**, Tsukakoshi discloses a router, wherein the subset of at least one protocol associated with the first routing protocol computing entity and the subset of at least one routing protocol associated with the second routing protocol computing entity are mutually exclusive subsets. **(In Tsukakoshi's cluster router device each component router's routing protocol means runs exactly one protocol at the time it is configured. See Figure 1. However each routing protocol means can run different protocols that are mutually exclusive to one another. In Column 6, Lines 4-5 it is shown that there is no restriction on the type of protocol that can run on router entity 12. See also Figure 3.)**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

33. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukakoshi et al (US 6, 577, 634), hereinafter referred to as Tsukakoshi, in view of Langille et al (US Pub. No. 2002/0097730), hereinafter referred to as Langille.

Langille discloses a similar network device to that of Tsukakoshi and includes virtual router subsystems.

Tsukakoshi discloses a router; wherein the subset of protocols associated with the first routing protocol computing entity is different from the subset of protocols associated with the second routing protocol and further discloses any protocol can be used and mentions the RIP protocol as an example. **(Column 3, Lines 18-23; Column 6, Lines 1-10; Tsukakoshi's router is not limited by the type of the routing protocol chosen.)** However, Tsukakoshi fails to expressly disclose that routing protocols can be OSPF and BGP.

Langille discloses a router **(Figure 1, element 14)**, wherein <u>the subset associated with</u> the first routing protocol <u>computing entity contains</u> BGP, and wherein the subset associated with the second routing protocol <u>computing entity contains</u> OSPF. **(See Paragraph 40, Lines 1-2 and Paragraphs 41 and 42)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use the BGP and OSPF

as the routing protocols. The motivation being Tsukakoshi indicates in Column 6, Line 5 and Column 3, Line 20 that many routing protocols are executed by the routing protocol means and Langille discloses the subset of protocols that can run on clustered routers like Tsukakoshi's in Figure 5.

34. **Claims 26-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukakoshi et al (US 6, 577, 634), hereinafter referred to as Tsukakoshi, in view of Gobrial (IEEE, 1996, Evaluation of Border Gateway Protocol V4 in the Tactical Environment.)

35. Regarding **claim 26,** Tsukakoshi discloses the aforementioned invention but does not disclose how at least one of the remote devices forming a peering session with the first routing protocol computing entity can be prevented from forming any peering session with the second routing protocol entity.

Gobrial discloses how the Border Gateway Protocol allows a router, wherein the first routing protocol computing entity is capable of establishing peering sessions with a first set of remote routing devices, the second routing protocol computing entity is capable of establishing peering sessions with a second set of remote routing devices, the first set of remote routing devices excluding at least one routing device that belongs to the second set of routing devices. **(Page 490, 2nd Column, Section 2, Paragraphs 1 and 2; BGP is a real inter-autonomous system routing protocol. BGP is a self-contained protocol. That is, it specifies how routing information is exchanged both between BGP speakers in different autonomous systems, and between BGP speakers within a single autonomous system. BGP-4's AS-PATH attribute**

includes sets of autonomous systems as well as lists. Therefore, the first set of remote routing devices can belong to one autonomous system and the second set can belong to a different autonomous system allowing BGP to enforce the exclusion.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use the Border Gateway Protocol as the routing protocol, the motivation being BGP V-4 has been widely adopted as the protocol for inter-autonomous communications.

36. Regarding **claim 27,** Tsukakoshi discloses the aforementioned invention but does not disclose how the remote devices forming a peering session with the first routing protocol computing entity can be prevented from forming any peering session with the second routing protocol entity.

Gobrial discloses how the Border Gateway Protocol allows a router such that the first set of remote routing devices forming a peering session can exclude any remote routing device from the second set. **(Page 490, 2nd Column, Section 2, Paragraphs 1 and 2; BGP is a real inter-autonomous system routing protocol. BGP is a self-contained protocol. That is, it specifies how routing information is exchanged both between BGP speakers in different autonomous systems, and between BGP speakers within a single autonomous system. BGP-4's AS-PATH attribute includes sets of autonomous systems as well as lists. Therefore, the first set of remote routing devices can belong to one autonomous system and the second**

set can belong to a different autonomous system allowing BGP to enforce the exclusion.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use the Border Gateway Protocol as the routing protocol, the motivation being BGP V-4 has been widely adopted as the protocol for inter-autonomous communications.

37. Regarding **claim 28,** Tsukakoshi discloses the aforementioned invention but does not disclose how the remote devices forming a peering session with the first and second routing protocol computing entity can be mutually exclusive sets.

Gobrial discloses how the Border Gateway Protocol allows a router such that the first set of remote routing devices forming a peering session can be mutually exclusive with the second set. **(Page 490, 2nd Column, Section 2, Paragraphs 1 and 2; BGP is a real inter-autonomous system routing protocol. BGP is a self-contained protocol. That is, it specifies how routing information is exchanged both between BGP speakers in different autonomous systems, and between BGP speakers within a single autonomous system. BGP-4's AS-PATH attribute includes sets of autonomous systems as well as lists. Therefore, the first set of remote routing devices can belong to one autonomous system and the second set can belong to a different autonomous system allowing BGP to enforce the exclusion.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use the Border Gateway

Protocol as the routing protocol, the motivation being BGP V-4 has been widely adopted as the protocol for inter-autonomous communications.

38. Regarding **claim 29,** Tsukakoshi discloses the aforementioned invention but does not disclose how the remote devices from different areas forming a peering session with the first and second routing protocol computing entity can be mutually exclusive sets.

Gobrial discloses how the Border Gateway Protocol allows a router such that the first routing protocol computing entity is capable of establishing peering sessions with remote routing devices from a first area, the second routing protocol computing entity is capable of establishing peering sessions with remote routing devices from a second area, the first area being different from the second area. **(Section 2, Page 490, 2nd Column, Paragraphs 1 and 2; BGP is a real inter-autonomous system routing protocol. BGP is a self-contained protocol. That is, it specifies how routing information is exchanged both between BGP speakers in different autonomous systems, and between BGP speakers within a single autonomous system. BGP-4's AS-PATH attribute includes sets of autonomous systems as well as lists. Therefore, the first set of remote routing devices can belong to one autonomous system and the second set can belong to a different autonomous system allowing BGP to enforce the exclusion.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use the Border Gateway

Protocol as the routing protocol, the motivation being BGP V-4 has been widely adopted as the protocol for inter-autonomous communications.

39. **Claims 35, 48 and 49** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukakoshi et al (US 6, 577, 634), hereinafter referred to as Tsukakoshi, in view of

Kent et al (IEEE, April 2000, Secure Border Gateway Protocol).

40. Regarding **claim 35**, Tsukakoshi teaches a router, comprising:

a. an interface layer including a plurality of I/O controllers, each I/O controller implementing an I/O port (**See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

b. a switching layer **(See Figure 1, element 13 and Figure 4, element 46)** in communication with the interface layer for selectively establishing signal pathways between the I/O ports **(See Figure 1, element 13; Figure 4, elements 18 and 46; See Column 4, Lines 39-43 to see how the switch layer interfaces with the forwarding units that act as I/O controllers. Column 4, Lines 53-64 indicates that each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

c. a routing layer **(Figure 1, element 20)** in communication with the interface layer **(Figure 1, element 18)**, the routing layer being capable of managing at least one peering session with a remote routing device, **(See Figures 10-13)** the peering session including the exchange of messages with the remote routing device through one of the I/O controllers **(Figure 2 and Column 3, Lines 58-67)**, the peering session being comprised of plurality of tasks **(See Figure 3 and Column 4, Lines 13-38)**;

d. the one I/O controller implementing a peer session assist module, **(This limitation is inherent because Tsukakoshi discloses like any router uses its Forwarding Unit that act as I/O controller to communicate with another remote router and there has to be peering session assist modules.)**

e. the peering session assist module being capable of performing some of the tasks of the peering session autonomously from the routing layer, **(This limitation is true in Tsukakoshi's system because the routing layer (Figure 1, element 20) and the I/O controller (i.e. Forwarding Units – Figure 1, element 18)**

f. the routing layer being capable of performing tasks of the peering session other than the tasks performed by the peering session assist module. **(This limitation is true in Tsukakoshi's system because the routing layer (Figure 1, element 20) and the I/O controller (i.e. Forwarding Units – Figure 1, element 18)**

Tsukakoshi does not disclose the tasks performed by the peering session assist module include authenticating messages received from the remote routing device.

Kent teaches Secure Border Gateway Protocol that provides authorization and authentication at the higher protocol level. For instance upfront at the forwarding unit it

will check if the peer that sent the update was authorized to act on behalf of its Autonomous State (AS). **(Page 582, Abstract and Section B. Correct Operation of BGP; It is much cheaper and secure to implement the authentication at the I/O layer/Forwarding Unit. Given that the Forwarding Units in the Applicant's invention as well as Tsukakoshi's use tables it would be very logical to one ordinarily skilled in the art to include the AS and BGP speaker table shown on page 586, Table II in the forwarding unit.)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use the Secure Border Gateway Protocol as the routing protocol, the motivation being to minimize security vulnerabilities.

41. Regarding **claim 48**, Tsukakoshi teaches a router wherein one of the tasks performed by the routing layer is applying an inbound policy processing on route information received from the remote routing device. **(See Column 3, Lines 23-27; Column 4, Lines 44-52. Tsukakoshi shows route calculation being done on the route information received from a remote device during a peering session. Inbound and outbound policy processing is inherent to these calculations and is simply strictly a function of the routing protocol. A good example of policy based routing protocol is BGP. Tsukakoshi's device can work with any routing protocol including BGP.)**

42. Regarding **claim 49**, Tsukakoshi teaches a router; wherein one of the tasks performed by the routing layer is applying an outbound policy processing on route

information. **(See Column 3, Lines 23-27; Column 4, Lines 44-52. Tsukakoshi shows route calculation being done on the route information received from a remote device during a peering session. Inbound and outbound policy processing is inherent to these calculations and is simply strictly a function of the routing protocol. A good example of policy based routing protocol is BGP. Tsukakoshi's device can work with any routing protocol including BGP.)**

43. **Claims 38 and 41** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukakoshi et al (US 6, 577, 634), hereinafter referred to as Tsukakoshi, in view of Fukushima et al (US 6, 049, 524), hereinafter referred to as Fukushima.

44. Regarding **claim 38**, Tsukakoshi teaches a router, comprising:

a. an interface layer including a plurality of I/O controllers, each I/O controller implementing an I/O port **(See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O interface or port to send to and receive packets from external routers like router 25 in Figure 1)**;

b. a switching layer in communication with the interface layer for selectively establishing signal pathways between the I/O ports **(See Figure 1, element 18; Figure 4, element 18;Column 4, Lines 53-64; Each forwarding unit acts as an I/O controller determining what to transmit, re-transmit, accept and reject from the incoming and outgoing packet traffic. Each forwarding unit has to have at least one I/O**

interface or port to send to and receive packets from external routers like router 25 in Figure 1);

c. a routing layer in communication with the interface layer **(See Column 4, Lines 39-52)**;

Tsukakoshi, however, fails to expressly disclose that the routing protocol implemented in the route calculating entity can be the Link State protocol.

Fukushima teaches a multiplex router device, shown in figure 2, and it is identical to that of Tsukakoshi's clustered router device, which is shown in Figure 14. Fukushima teaches that his system can implement Link State protocol as one of the routing protocols and is indicated by element 22 in Figure 2. **(See also Column 5, Lines 50-75 and Column 6, Lines 1-5)**

Fukushima further discloses each I/O controller **(i.e. Forwarding Unit)** implements an LSA entity, where the LSA entity includes an LS database **(See Element 19 in Figure 2; Column 6, Lines 7-11; Since Fukushima teaches that the routing protocol is a link state protocol there has to be an LSA entity in both the router and I/O Controller layer)**, and the LSA entity is responsive to an LSA message from a remote routing device **(Column 1, Lines 53-57)** including LS information to:

i. update the LS database **(Column 1, Lines 66-67 and Column 2, Lines 1-7)**;

ii. forward the LS information to the routing layer **(Column 2 Lines 1-20)**;

iii. forward the LS information to at least another I/O controller of the interface layer**(Column 2, Lines 1-20 and 32-43)**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use the link state protocol as the routing protocol, the motivation being minimizing the amount information being sent to the standby mode routing calculation unit. If the link state protocol is used as the routing protocol then only the link state information can be sent to the routing calculation unit in standby mode thereby minimizing internal traffic between the active and standby units.

45. Regarding **claim 41**, Tsukakoshi teaches all aspects of the claimed invention as set forth in the rejection of claim 38 but fails to teach a routing layer that includes a main control computing entity and a backup computing entity with each entity with its own routing table manager.

Fukushima teaches a routing layer that includes a main control computing entity and a backup computing entity with each entity with its own routing table manager. Specifically Fukushima teaches a router, wherein the routing layer includes:

a. a control computing entity in data communicative relationship with each I/O controller **(element 13 in Figure 14)**, where the control computing entity**(element 11 in Figure 14)**, includes:

i. a CPU **(element 40 in Fig.14)**;

ii. a data storage medium in communication with the CPU **(element 41 in Figure 14)**;

iii. a master routing table stored in the data storage medium, where the master routing table holding a master routing database derived at least in part from the

LS database of at least one of the I/O controllers **(elements 19 in Figure 2; Column 2, Lines 4-7 and 40-42; Column 5, Lines 51-67 and Column 6, Lines 1-11)**;

iv. a program data in the data storage medium to implement a main routing table manager to manage the master routing table **(element 18 in Figure 2; Column 5, Line 66)**;

b. a backup computing entity in data communicative relationship with at least one of the I/O controller, where the backup computing entity **(Column 7, Lines 30-45; Fukushima discloses that the backup or standby computing entity is identical to the active entity shown in Figure 2. Therefore the active and backup entities have identical hardware setup.)** including:

i. a CPU **(element 40 in Fig.14)**;

ii. a data storage medium in communication with the CPU of the backup computing entity; **(element 41 in Fukushima's figure 14)**;

iii. program data in the data storage medium of the backup computing entity for execution by the CPU of the backup computing entity to implement a main routing table manager **(element 18 in Fukushima's Figure 2; Column 5, Line 66)**;

iv. the backup computing entity being responsive to an operational failure of the control computing entity **(Column 7, Lines 46-52)** to:

1. transfer information from at least one of the I/O controllers to re-build the LS database **(Column 7, Lines 53-67)**;

2. enable the program data in the data storage medium of the backup computing entity to act as a main routing table manager **(Column 7, Lines 46-52; Once the standby unit becomes active it becomes the main routing table manager**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsukakoshi's clustered router to use a routing table manager and the link state protocol as the routing protocol in the computing entities, the motivation being minimizing the amount information being sent to the standby mode routing calculation unit. If the link state protocol is used as the routing protocol then only the link state information can be sent to the routing calculation unit in standby mode thereby minimizing internal traffic between the active and standby units.

46. **Claims 39 and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukakoshi et al (US 6, 577, 634), hereinafter referred to as Tsukakoshi, in view of Fukushima et al (US 6, 049, 524), hereinafter referred to as Fukushima, in further view of Zinin et al (US 6, 820, 134), hereinafter referred to as Zinin.

47. Regarding **claim 39**, the modified invention of Tsukakoshi and Fukushima as taught above disclosed the aforementioned invention including the existence of an LSA entity. However the modified invention of Tsukakoshi and Fukushima fails to teach that; the router upon receiving an LSA message, it will verify whether the LS information is present or not in the LS database and consequently takes appropriate action.

Zinnin teaches that when an entity receives an LSA message then it needs to check whether the LS information is present or not in the LS database and update the

database if the info exists or discard the LSA if the info already exists in the LS database. **(Column 8, Lines 59-60 and Column 11, Lines 5-10)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified invention of Tsukakoshi's and Fukushima's clustered router to use the link state protocol as the routing protocol, the motivation being minimizing the amount information being sent to the router. If the link state protocol is used as the routing protocol then only the link state information can be sent to the routing calculation unit in standby mode thereby minimizing internal traffic between the active and standby units. Also it allows an efficient flooding system resulting in conserving bandwidth and speeding the router.

48. Regarding **claim 40**, the modified invention of Tsukakoshi and Fukushima as taught above disclosed the aforementioned invention including the existence of an LSA entity. It also disclosed that the LSA entity **(LSA entity is simply the ability to handle LS protocol at the forwarding unit)** is responsive to LS information received from any I/O controller **(i.e. forwarding unit)** and being able to transmit the LSA message including the LS information to a remote routing device. **(Fukushima, Column 7, Lines 30-45)**

Response to Arguments

49. Applicant's arguments filed have been fully considered but they are not persuasive.

50. Applicant in the Remarks, on page 18 in the 3rd paragraph and page 26 in the 2nd paragraph, argues that Tsukakoshi does not teach or suggest first and second routing

protocol computing entities each associated with a distinct subset of at least one routing protocol from a common set of routing protocols. Examiner respectfully disagrees with Applicant's conclusion. Examiner would like to suggest to the Applicant to further review the rejection of claim 1c of this Office Action. The Examiner has meticulously shown that Tsukakoshi's system can run different routing protocols at the same time. What the Applicant refers to as "common set of routing protocol" is applicable to Tsukakoshi as his system is not restricted to any particular routing protocol. In fact he shows the type of routing protocol is immaterial to his system by using general labels as A, B, C.....

51. Applicant in the Remarks, on page 20 in the last paragraph in lines 9-12, argues the routing table 17 in all of the route calculation units 20 contains the same routing information for a given routing protocol. Examiner respectfully disagrees with the Applicant's conclusion. Examiner would like to suggest to the Applicant to further review the rejection of claim 23 g, h, and i. The Applicant need to realize that in Tsukakoshi's system specific to each routing protocol routing information derived from a peering session with a remote entity is stored separately as network information and this can in effect be a routing table specific to the protocol. The routing table 17 only contains non-protocol specific routing information similar to the master routing table forwarded to all units in the Applicant's invention. As the Applicant has correctly pointed out that there is a unique routing table 17 in Tsukakoshi's system for each routing protocol in a given router in the clustered router system. However there is no reason to assume the routing table 17 is identical between two routers running the same protocol

as the data is built by routing information exchange during a peering session and as such depends on the specific router participation in such a session.

52. Applicant in the Remarks, on pages 22 and 24, last paragraph, argues Tsukakoshi's system does not have a control computing entity. Examiner respectfully disagrees with Applicant's conclusion. Tsukakoshi's computing entity work as active as well as a backup. The active computing entity can be considered as a control computing entity. See Figure 18. The embodiment described in Figure 18 shows the active controlling computing entity in constant communication with the back-up entities.

53. Applicant in the Remarks, on page 28 in the last paragraph argues, that a "BGP speaker" is a system or node running BGP protocol and not a router. Examiner respectfully disagrees with Applicant's conclusion. A BGP speaker is simply a router running a BGP protocol, which is very well known in the networking art, and is further verified by Kent on page 590, 2nd column, Line 4. Examiner would like to suggest to the Applicant to further review the rejection of claim 35. Kent gives an elaborate discussion on how authentication can be done on BGP routers. Kent shows a table structure on 586 that can be used for authentication. It would be very obvious to one ordinarily skilled in the art to place this table in the forwarding units as such units in Tsukakoshi's system already check tables to forward packets. It is well known in the art authentication is simpler, safer and cheaper if done upfront and placing such a check in the forwarding unit is natural.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following US and European Patent Application describes a multiple virtual router with a controlling entity:

European Patent Application (EP 0 926 859 A2) to Scott et al

US Pub. No. (2002/0141378) to Bayes et al

The following US Patent describes policy management:

US Patent (5, 889, 953) to Thebaut et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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